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MINISTRY OF IRRIGATION AND POWER

REPORT

OF

THE KRISHNA GODAVARI COMMISSION

Annexure XIII

Particulars of Irrigation and Hydro-electric schemes which came into operation after March, 1951

July 1962

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FOREWORD

The data presented in this Annexure relate to irrigation and hydro-electric schemes on the Godavari river system which have come into operation after Mareh 1951, and are based on the information obtained from the State Governments of Andhra Pradesh, Madhya Pradesh, Maharashtra, Mysore and Orissa supplemented, here and there, by information collected from project reports, administration and other reports and offieial correspondence between the State Governments and the Planning Commission or the Ministry of Irrigation and Power.

GODAVARI RIVER SYSTEM

Statment showing installed power, maximum to-date and ultimate annual irrigation and annual diversion

Name of State/ Category of scheme	*Number*	*Power installed (kW.)*	*C.C.A. or Ayacut*	*Annual irrigation*		*Annual diversion*	
				Maximum to-date	*Ultimate*	*Maximum to-date*	*Ultimate*
1	2	3	4	5	6	7	8
			.....acres.....			...T.M.C....	
ANDHRA PRADESH			*Ayacut*				
Major and medium schemes	3	129,750	65,000	5,000	85,000	1·0	16·2
Minor schemes	3	...	4,978	2,052	5,000	11·7	14·2
Small tanks and diversions	1,815	...	93,621	67,948	80,000		
Total	**1,821**	**129,750**	**163,599**	**75,000**	**170,000**	**12·7**	**30·4**
MADHYA PRADESH			*C.C.A.*				
Major and medium schemes	3	...	37,400	13,400	23,800	1·5	1·8
Minor schemes	7	...	8,212	4,007	6,000	1·0	1·2
Small tanks and diversions	36	...	9,636	6,680	8,000		
Total	**46**	...	**55,248**	**24,087**	**37,800**	**2·5**	**3·0**
MAHARASHTRA							
Major and medium schemes	2	...	76,600	11,300	51,500	1·8	7·9
Minor schemes	7	...	7,758	858	5,000	0·3	0·6
Small tanks and diversions	105	...	8,466	4,711	6,000		
Total	**114**	...	**92,824**	**16,869**	**62,500**	**2·1**	**8·5**
MYSORE							
Major and medium schemes	Nil	...	...	...	...	...	...
Minor schemes	Nil	...	...	...	...	...	...
Small tanks and diversions	Nil	...	...	...	...	...	...
Total	Nil	...	...	...	...	...	...
ORISSA			*Ayacut*				
Major and medium schemes	1*						
Minor schemes	5	...	4,261	4,261	4,261	1·5	1·5
Small tanks and diversions	116	...	13,679	13,679	13,679		
Total	**122**	...	**17,940**	**17,940**	**17,940**	**1·5**	**1·5**
Total of major and medium schemes	8	129,750	179,000	29,700	160,300	4·3	25·9
Total of minor schemes and small tanks and diversions	2,094	...	150,611	104,196	127,940	14·5	17·5
Grand Total	**2,102**	**129,750**	**329,611**	**133,896**	**288,240**	**18·8**	**43·4**

* *Common with Andhra Pradesh*

INTRODUCTION

1.1 After a preliminary study of the nature and extent of irrigation developments, existing and proposed, in the Krishna and Godavari basins and after general discussions with the representatives of the State Governments concerned, the Commission decided to classify all schemes and projects into the following four groups:

(*i*) Major schemes to include all power projects and such other schemes as would each irrigate 50,000 acres or more annually;

(*ii*) Medium schemes — each intended to irrigate less than 50,000 acres annually but having an Ayacut or C.C.A. of not less than 5,000 acres;

(*iii*) Minor schemes — each having an Ayacut or C.C.A. of less than 5,000 acres but not less than 500 acres; and

(*iv*) Small tanks and diversions — each having an Ayacut or C.C.A. of less than 500 acres.

1.2 A form was drawn to show in detail such particulars of schemes and projects as were relevant to the Commission's work and the State Governments were requested to furnish the requisite data for each major and medium scheme, which came into operation after March, 1951. This form with explanatory note, is shown in Section 2. It was, however, found that the information sought by the Commission was not readily available with the State Governments; each State, therefore, set out to collect as much information as could be compiled in the time available.

Particulars of each major and medium project, as obtained from the State Governments, are given in Section 3. These were shown in draft form first to the representatives of the State Governments concerned, for verification. After appropriate modifications had been made, the revised drafts were discussed in a joint meeting at which the Commission had the benefit of comments made and views expressed by the representatives of other States. This led to some further changes, which have all been incorporated in Section 3. Some gaps in the data required still remained. These have been filled by the Commission; the assumed figures are shown in brackets.

1.3 The significance of the index numbers, as given to each project in Section 3, is the same as explained in the Commission's Report.

1.4 Important particulars of all major and medium schemes arranged State-wise are given in Table I, including the maximum to-date and ultimate annual irrigation and the maximum to-date and ultimate annual diversion by each scheme.

1.5 Since each minor scheme utilises but a small quantity of water, since the number of such schemes is relatively large and since most of the particulars specified for the major and medium projects were not available for the minor schemes, the Commission decided to request the State Governments

to furnish only a few important facts regarding each minor scheme. These have been presented in Table II, to the extent these could be made available by the State Governments.

1.6 As regards small tanks and diversions, their number runs into thousands and even the particulars called for the minor schemes were not available for individual small tanks and diversions. It was, therefore, decided to collect some particulars regarding these small tanks and diversions, not by individual works, but collectively for all the small tanks and diversions in each district. Even this information was not wholly available. The information obtained is shown in Table III.

1.7 An abstract of all information available regarding minor schemes and small tanks and diversions is shown in Table IV. This Table gives the number of total schemes of this kind, district-wise, the areas irrigated during 1959-60 or 1960-61 and the annual diversion during 1959-60 or 1960-61. The Commission have attempted to fill in the gaps in the data; the figures assumed are shown in brackets and suitable notes have been added to indicate the basis on which the assumptions have been made.

No records are available of the quantum of river supplies diverted by minor schemes or by small tanks and diversions. In order to get some idea of this quantum, the information contained in Table VI was collected from each State Government and was utilised in working out the annual diversions shown in Table IV.

1.8 The total number of schemes in each State, the total area irrigated and the total river supply diverted are shown in a statement in the beginning of the Annexure.

Section 3

Particulars of Major and Medium Projects

Section 2

General form
for
Recording particulars of major and medium projects
which came into operation
after March, 1951
with
explanatory notes


सत्यमेव जयते

Name of Scheme or System

Index Number
indicating serial number,
category of project,
sub-basin and State or States

1. **Name of State**

State or States benefitted by the scheme; if the scheme was in a different State prior to re-organisation of States, also the name of that State.

2. **Scope of the scheme or system**

Irrigation, hydro-electric or multi-purpose; if multi-purpose, all purposes are stated;
Whether based on flow or flow-cum-storage;
For irrigation schemes, acreage of C.C.A. or Ayacut is given;
For hydro-electric schemes, installed power in kW. is stated.

3. **Source of supply**

Name of channel with name of place where diversion works are located, tributary and river.
Illustration: Sina at Sholapur/Bhima/**Krishna**
Upstream uses if any, existing and proposed.

4. **Description of the reservoir or tank**

Live storage; dead storage; carry-over; annual reservoir losses; filling period; depletion period; catchment area; area submerged; full reservoir level; minimum pond level or dead storage level.

If no canal takes off from the reservoir or tank :

type, length and height of dam; length and capacity of spillway; and number and capacity of outlets.

5. **Description of the headworks**

If a canal takes off above the dam :

type, length and height of dam, length and capacity of spillway, number and capacity of outlets including particulars of head regulator of the canal.

If the head works consist of a weir, anicut or barrage:

length of weir, anicut or barrage with discharging capacity; particulars of under sluices and of head regulator of canal; minimum pond level and catchment area upstream of headworks.

6. **Description of the canals**

Name of canal (contour or ridge); whether taking off on right or left; length of main canal (and of branches); one seasonal, two seasonal or perennial; lined or unlined; authorised capacity at head.

7. **Date of beginning of construction**

8. **Date of beginning of operation**

9. **Probable date of beginning of full operation**

IRRIGATION ASPECTS

10. Gross commanded area, culturable commanded area and Ayacut, district-wise

(*i*) In general, separate tables are prepared for each major canal;

(*ii*) Ayacut figures are not given for schemes in Madhya Pradesh and Maharashtra

Item	*Names of districts*				*Total*
	..... *thousand acres*.....				
G.C.A.					
C.C.A.					
Ayacut					

11. Area irrigated annually and intensity of irrigation

(*i*) Where the area irrigated is more than 10,000 acres, yearly crop-wise figures are given in *Annexure I* ;

(*ii*) intensity of irrigation is worked out as percentage of area irrigated on total C.C.A. in case of Madhya Pradesh and Maharashtra and on Ayacut in case of Andhra Pradesh, Mysore and Orissa;

(*iii*) all figures are correct to first place of decimal.

	Area irrigated annually	*Intensity of irrigation*
	.....*thousand acres*.....	.....*percentage*.....
(i)	Proposed	
(ii)	Actual maximum	

12. Normal rainfall and river supply diverted

(*i*) If there is more than one canal, separate tables are prepared for each major canal;

(*ii*) figures in column 2 are as read from monthly Isohyetal maps;

(*iii*) figures in columns 3 and 4 are based on the sum-total of the rainfall figures for the month for all the stations in the commanded area divided by the number of stations;

(*iv*) figures in columns 7 and 8 represent

$$\frac{\text{average cusecs diverted during the month}}{\text{authorised capacity of the canal}}$$

(*v*) figures in columns 2 to 4 are correct to first place of decimal and those in columns 5 to 8 to two places of decimal.

Month	*Rainfall*			*River supply diverted*		*Capacity factor*	
	Normal	*Maximum*	*Minimum*	*Acutal maximum*	*Proposed*	*Actual maximum*	*Proposed*
1	2	3	4	5	6	7	8
	.....*inches*.....			.....*T.M.C*.....			
June							
July							
...							
...							
...							
April							
May							
Total							

13. (a) **Depth of sub-soil water-table below ground level**

(b) **Nature and extent of annual fluctuation in the water-table**

(c) **Has any study been made of the likely effect of the introduction of irrigation on sub-soil water-table ?**

Information is given only where data based on regular observations are available

14. (a) **Characteristics of soil(s) in the commanded area**

Results of scientific soil survey, if carried out, are given; otherwise, general classification specifying soil texture with depth of soil crest.

(b) **Has any study been made of the likely effect of the introduction of irrigation on soil characteristics ?**

Information is given only when scientific studies have been made

15. Pattern of cultivation in the area commanded before the scheme came into operation

(*i*) Paddy, wheat, sugarcane and cotton are specified individually; any other crop which covers more than 5 percent of the total cropped area is also specified, all other crops are grouped under 'others'.

(*ii*) crop percentages are worked out on the 'Total cropped area' as given in the last column and are correct to the first place of decimal.

Perennial		*Two seasonal*				*Total cropped area (T. acres)*
Percentage of principal crops	*Total area (T. acres)*	*Percentage of principal crops*	*Total area (T. acres)*	*Percentage of principal crops*	*Total area (T. acres)*	

16. (a) Proposed pattern of irrigated cultivation

(i) Paddy, wheat, sugarcane and cotton are specified individually; any other crop which covers more than 5 percent of the total cropped area is also specified, all other crops are grouped under 'others'.

(ii) crop percentages are worked out on the 'Grand Total' as given in the last column and are correct to the first place of decimal.

Perennial		*Two seasonal*				*Grand Total (T. acres)*
Percentage of principal crops	*Total area (T. acres)*	*Percentage of principal crops*	*Total area (T. acres)*	*Percentage of principal crops*	*Total area (T. acres)*	

(b) Are there any rules for regulating crop pattern ?

17. Actual crop pattern obtained after the introduction of irrigation

(i) Paddy, wheat, sugar-cane and cotton are specified individually ; any other crop which covers more than 5 percent of the total cropped area is also specified, all other crops are grouped under 'others'.

(ii) crop percentages are worked out on the 'Grand Total' as given in the last column and are correct to the first place of decimal.

(iii) where the area irrigated annually is more than 10,000 acres, cropwise figures are given in *Annexure I.*

Perennial		*Two seasonal*				
Percentage of principal crops	*Total area (T.acres)*	*Percentage of principal crops*	*Total area (T. acres)*	*Percentage of principal crops*	*Total area (T. acres)*	*Grand Total (T. acres)*

18. Duty and Delta and canal head

(i) Overall delta (as anticipated) represents

$$\frac{\text{total annual river supply diverted (proposed) vide item 12}}{\text{area proposed to be irrigated vide item 16}}$$

(ii) Overall delta (as obtained) represents

$$\frac{\text{total annual river supply diverted (actual) vide item 12}}{\text{area actually irrigated vide item 17}}$$

As anticipated							*As obtained*			
Duty (acres per mean cusec)			*Delta (feet)*				*Delta (feet)*			
Perennial	*Kharif*	*Rabi*	*Perennial*	*Kharif*	*Rabi*	*Overall*	*Perennial*	*Kharif*	*Rabi*	*Overall*

19. (a) Number of tanks in operation in the irrigated area and the area irrigated therefrom

It is specified whether area irrigated by tanks is included in or excluded from the C.C.A. or Ayacut of the project.

(b) Number of wells in operation in the irrigated area and the area irrigated therefrom

It is specified whether area irrigated by wells is included in or excluded from the C.C.A. or Ayacut of the project.

20. Quantum of river supplies available in relation to withdrawals

Whether river supply data available; the period of the year in which flow supplies are adequate to meet irrigation requirements; number of days during which flow supplies are in excess of irrigation requirements and quantum of excess; period during which irrigation requirements are met wholly or partly from storage and quantum so obtained.

POWER ASPECTS

21 River supplies diverted and operation head

Month	*As during .....*		*As proposed*	
	Range of operation head (feet)	*Mean supply passing through turbines (cusecs)*	*Range of operation head (feet)*	*Mean supply passing through turbines (cusecs)*
June				
July				
—				
—				
April				
May				
Total		T.M.C.		T.M.C.

22. Disposal of tail-race waters

Where information is not available month-wise, the disposal of tail-race waters is indicated in general terms.

Month	*During.....*	*As proposed*
June		
July		
—		
—		
April		
May		

23. Development of load compared with power potential provided

Up to-date position is indicated

24. Quantum of river supplies available in relation to withdrawals

Whether river supply data available; the period of the year in which flow supplies are adequate to meet power requirements; number of days during which flow supplies are in excess of power requirements; period of the year during which power requirements are met wholly or partly from storage and quantum so diverted.

GENERAL

25. Aspects other than irrigation and power; water supply (month-wise), if any, required for these aspects ; financial returns

Aspects such as navigation, water supply for towns and supplies given for industrial uses are specified; average utilisation for a number of years is given and the years specified.

26. Total cost of the scheme

27. Cost per acre irrigated

28. Cost per kW. installed

29. Financial return of the scheme

(i) as anticipated

(ii) as obtained

Worked out as percentage of net return (gross return less working expenses) on the total capital outlay.

30. Main features and purpose of the scheme

31. Special features of the scheme

This item is included only if there are any special features not covered by item 1 to 30 above

NIZAMSAGAR HYDRO-ELECTRIC SCHEME 1B-G.4-A.1

1. **Name of State** Andhra Pradesh (formerly in Hyderabad)

2. **Scope of the scheme or system**

Multipurpose scheme ; flow-cum-storage; power units in the canal, $3 \times 5{,}000 = 15{,}000$ kW.; operation head 35 to 65 feet; for irrigation aspects see **5A-G.4-A.5**

3. **Source of supply**

Manjra at Atchampet/**Godavari**

4. to 6. Same as for **5A-G.4-A.5,** except that the minimum draw-down level for hydro-electric purposes is R.L. 1,375 against R.L. 1,364 shown in **5A-G.4-A.5** and the live storage above R.L. 1,375 is 21.90 T.M.C. against 25.60 T.M.C. shown in **5A-G.4-A.5**

7. **Date of beginning of construction** 1946

8. **Date of beginning of operation** January 1955

9. **Probable date of beginning of full operation** February 1956

10. to 20. Not applicable

POWER ASPECTS

21. **River supplies diverted and operation head**

Month	*As during 1960-61*		*As proposed*	
	Range of operation head (feet)	*Average supply passing through turbines (cusecs)*	*Range of operation head (feet)*	*Average supply passing through turbines (cusecs)*
June	40	910		1,170
July	55	1,660	Varies from 65	2,670
August	54	2,110	feet to 35 feet	3,000
September	54	1,850		3,000
October	60	2,100		2,970
November	58	1,450		1,600
December	58	580		352
January	58.5	480		1,300
February	55.4	370		1,260
March	52	475		1,690
April	49	550		1,470
May	42.5	725		706
Total		**35.0 T.M.C.**		**55.8 T.M.C.**

22. Disposal of tail-race waters

After generation of power, water is let into the irrigation channel

23. Development of load compared with power potential provided

The entire power potential is being used

24. Quantum of river supplies available in relation to withdrawals

In 24 years out of 26, river supply was much in excess of power requirements as of 1960-61.

For the power use now proposed, *viz.*, 55.8 T.M.C., this supply is not available in 4 years out of 26.

GENERAL

25. Aspects other than irrigation and power; water supply (month-wise), if any, required for these aspects; financial returns

Nil

26. Total cost of the scheme — Rs. 2,40 lakhs

27. Not applicable

28. Cost per kW. installed — Rs. 1,600

29. Financial return of the scheme

(i) as anticipated — 4.57 percent

(ii) as obtained — 1959-60 — 8.51 percent
1960-61 — 6.58 percent

30. Main features and purpose of the scheme

Electrification of Hyderabad city and Nizambad

KADDAM PROJECT 2B-G.5-A.2

1. **Name of State** Andhra Pradesh (formerly in Hyderabad)

.2 **Scope of the scheme or system**
Irrigation scheme; flow-cum-storage; Ayacut 65,000 acres

3. **Source of supply**
Kaddam/Godavari

4. **Description of the reservoir or tank**

Live storage	4.82 T.M.C.
Dead storage	2.78 ,,
Carry-over	Nil
Annual reservoir losses	0.90 T.M.C.
Filling period	July to September
Depletion period	October to May
Catchment area	1,000 square miles
Area submerged	6,106 acres
Full reservoir level	R.L. 700
Minimum pond level	R.L. 675

5. **Description of the headworks**

Dam :	7,530 feet long, about 100 feet high
Spillway :	1,240 feet, capacity 430,720 cusecs
Scouring sluices :	four of 8 feet × 10 feet each, total capacity 15,448 cusecs and six of 8 feet × 10 feet each, total capacity 28,840 cusecs

6. **Description of the canal**
Godavari North Canal (contour); left bank; 48 miles long ; perennial; unlined; authorised capacity **1,100 cusecs**

7. **Date of beginning of construction** 1949 ; but project revised in 1958

8. **Date of beginning of operation**
July 1955, but the dam breached in 1958 and has since been restored.

9. **Probable date of beginning of full operation** Not yet known

IRRIGATION ASPECTS

10. **Gross commanded area, culturable commanded area and Ayacut, district-wise**

District Adilabad

G.C.A.	164,000 acres
C.C.A.	131,200 ,,
Ayacut	65,000 ,,

11. Area irrigated annually and intensity of irrigation

	Area irrigated annually	*Intensity of irrigation on Ayacut*
(*i*) Proposed	85,000 acres	130.8 percent
(*ii*) Actual maximum	5,000 acres (assumed)	

12. Normal rainfall and river supply diverted

Month	*Rainfall*			*River supply diverted**		*Capacity factor*
	Normal	*Maximum*	*Minimum*	*Actual maximum*	*Proposed*	*Proposed*
1	2	3	4	5	6	7
	... .*inches*			.....*T.M.C*.....		
June	9.0	11.8	1.7		1.75	0.61
July	9.7	12.1	6.8		2.25	0.76
August	10.9	21.1	6.2		2.25	0.76
September	7.7	11.3	5.2		2.25	0.79
October	3.5	4.8	1.6		1.75	0.59
November	Nil	Nil	Nil		1.75	0.61
December	0.4	1.6	,,		0.80	0.27
January	Nil	0.2	,,		0.80	0.27
February	0.1	0.7	,,		1.00	0.38
March	0.1	0.3	,,		1.00	0.34
April	0.2	0.4	,,		0.40	0.14
May	0.5	2.0	,,	1.00**	0.20	0.07
Total	**42.1**			**1.00****	**16.20**	

**data of actual withdrawals since 1955 are stated to be not available*

***assumed*

13. Not available

14. (a) Characteristics of soils in the commanded area

Shallow sandy loam, medium deep to deep sandy loam, and black cotton type loamy soils.

(b) Has any study been made of the likely effect of the introduction of irrigation on soil characteristics ?

No

15. Pattern of cultivation in the area commanded before the scheme came into operation

Kharif							*Rabi*					
Percentage of principal crops						*Total area (T. acres)*	*Percentage of principal crops*				*Total area (T. acres)*	*Total croped area (T. acres)*
Maize	*Pulses*	*Ses-mum*	*Gro-undnut*	*Abi (Paddy)*	*Others*		*Jowar*	*Gram*	*Tabi (Paddy)*	*Others*		
6.0	17.8	10.0	7.6	6.5	3.2	67.1	38.2	6.8	1.2	2.7	64.1	131.2

16. (a) Proposed pattern of irrigated cultivation

Abi		*Tabi*		
Percentage of principal crops	*Total area (T. acres)*	*Percentage of principal crops*	*Total area (T. acres)*	*Grand Total (T. acres)*
Paddy		*Paddy*		
76.5	65.0	23.5	20.0	85.0

(b) Are there any rules for regulating crop pattern? No

17. Not available

18. Duty and Delta at canal head

Abi, June to November, 165 days

Tabi, December to May, 130 days

As anticipated

Duty (acres per mean cusec)		*Delta (feet)*		
Abi	*Tabi*	*Abi*	*Tabi*	*Overall*
77	54	4.3	4.8	4.4

19. (a) Number of tanks in operation in the irrigated area and the area irrigated therefrom

239 tanks, irrigating about 4,700 acres, excluded from the Ayacut

(b) Number of wells in operation in the irrigated area and the area irrigated therefrom

Nil

20. Quantum of river supplies available in relation to withdrawals

River supply data not available

21. to 24. Not applicable

GENERAL

25. Aspects other than irrigation and power; water supply (month-wise), if any, required for these aspects; financial returns

Nil

26. Total cost of the scheme Rs. 6,01 lakhs (revised)

27. Cost per acre irrigated Rs. 718

28. Not applicable

29. Financial return of the scheme

(i) **as anticipated** 1.36 percent

30. Main features and purpose of the scheme

Conversion of rain-fed cultivation to irrigated agriculture

31. Special features of the scheme

The scope of this project, as given here, is larger than in the original estimate. It is now proposed to divert 16.2 T. M. C. against 12.0 T. M. C. in the original project; and the area proposed to be irrigated is 85,000 acres as against 75,000 acres mentioned in the III Plan

MACHKUND HYDRO-ELECTRIC SCHEME 3B-G.12-A.3/O.1

1. **Name of State** Andhra Pradesh and Orissa (formerly in Madras and Orissa)

2. **Scope of the scheme or system**

Hydro-electric scheme; power units, 3 x 17,000 kW. and 3 x 21,250 kW., total 114,750 kW. (The project being a joint venture of the Governments of Andhra Pradesh and Orissa, for the first 99 years, they would share the cost and the benefits in the ratio of 70: 30; after 99 years in the ratio of 50:50.)

3. **Source of supply**

Machkund (Sileru) at Jalaput/Sabari/**Godavari**
Utilisation upstream, existing and proposed: minor schemes only

4. **Description of the dam and reservoir or tank**

Live storage	31.50 T.M.C.
Dead storage	2.75 ,,
Carry-over	Nil
Annual reservoir losses	4.00 T.M.C.
Filling period	July to October
Depletion period	November to June
Catchment area	755 square miles
Area submerged	24,000 acres
Full reservoir level	R. L. 2,750
Dead storage level	R. L. 2,685

Dam: masonry, 1,300 feet long, 148 feet high
Spillway: ogee type with 8 gates, each 60 feet x 20 feet
Outlets: two scour pipes, 2 feet 6 inches diameter, capacity 2,250 cusecs each (total 4,500 cusecs)
three power pipes, 8 feet 6 inches diameter, capacity 2,200 cusecs each (total 6,600 cusecs)

5. **Description of the headworks**

Diversion Dam: 14 miles downstream of the storage reservoir at Jalaput;
overflow section : 560 feet long, fitted with 8 gates, 60 feet x 20 feet each, and
scour sluices : one, 12 feet x 8 feet and one, 3 feet x 3 feet ;

Head sluices :	two, 12 feet x 8 feet each;
Full reservoir level	R.L. 2,590;
Minimum pond level	R.L. 2,565

6. **Description of the canal**

Power channel, off-taking from the right flank of Diversion Dam; 12,000 feet long; lined; authorised capacity **1,800 cusecs**

7. **Date of beginning of construction** 1947

8. Date of beginning of operation 1955

9. Probable date of beginning of full operation 1959

10. to 20. Not applicable

POWER ASPECTS

21. River supplies diverted and operation head at the end of the power channel

Month	*Maximum so far*		*As proposed*	
	Range of operation head (feet)	*Average supply passing through turbines (cusecs)*	*Range of operation head (feet)*	*Average supply passing through turbines (cusecs)*
June	837	1,050	837	1,400
July	837	1,040	837	1,400
August	837	1,190	837	1,400
September	837	950	837	1,400
October	837	1,050	837	1,400
November	837	910	837	1,400
December	837	863	837	1,400
January	837	810	837	1,400
February	837	870	837	1,400
March	837	1,320	837	1,400
April	837	1,360	837	1,400
May	837	1,240	837	1,400
Total		33.3 T.M.C.		44.2 T.M.C.

22. Disposal of tail-race waters

The tail-race waters are letinto the river which joins Godavari. There is no irrigation use at present ; but future utilisation for both irrigation and power is planned.

23. Development of load compared with power potential provided

Power potential provided at Machkund at present is 114.75 M.W. (without any spare). Maximum load reached was 106 M.W.

24. Quantum of river supplies available in relation to withdrawals

In most years, the river supply available is more than that required for power development at the rate now proposed.

GENERAL

25. Aspects other than irrigation and power; water supply (month-wise), if any, required for these aspects; financial returns

A power potential of about 19,000 kW. (at 60 percent load factor) at the Jalaput dam remains to be developed

26. Total cost of the scheme Rs. 15,67 lakhs

27. Not applicable

28. Cost per kW. installed Rs. 1,366

29. Financial return of the scheme

(i) **as anticipated:** 6.10 percent at the end of the 10th year of operation (including expenditure on transmission lines and the thermal station).

(ii) **as obtained:** 1960-61—3.93 percent

30. Main features and purpose of the scheme

Power from Machkund is utilised to feed the coastal area of Andhra Pradesh from Srikakulam to Nellore District (450 miles). The following industries have come up in the coastal region of Andhra, because of availability of power from Machkund.

Caltex Refinery at Vizag	3,500 kW.
Ferro-Manganese Factory at Garividi	20,000 ,,
Krishna Cement Factory at Tadepalli	4,600 ,,
Rama Krishna Cements at Macherla	2,500 ,,
Andhra Caustic Soda *etc.* at Niddravolu-Tanuku	10,000 ,,

In Orissa, power from this project is utilised for domestic purposes and for the Ferro-manganese plant at Raigarh.

31. Special features of the scheme

The first stage development of this scheme, which was sanctioned in the First Five Year Plan comprised construction of a main storage dam at Jalaput, with a gross capacity of 25,650 M. Cft., and an installed capacity of 94,000 kW. The second stage of the Machkund scheme approved by the Planning Commission in August, 1958 provides for raising the height of the Jalaput dam by 10 feet from originally proposed level of 2,748 feet to 2,758 feet, thereby increasing the effective storage capacity to 31,550 M. Cft., and for the installation of additional installed capacity of 21,250 kW.

SAGARNADI TANK 4B-G.9-Ma.1

1. **Name of State** Madhya Pradesh

2. **Scope of the scheme or system**

Tank irrigation scheme; C.C.A. 5,400 acres

3. **Source of supply**

Sagarnadi near Chitapur Tola/Waingana/Pranhita/**Godavari**

Utilisation upstream:

existing: nil

proposed: minor irrigation schemes which envisage irrigation of 500 acres

4. **Description of the reservoir or tank**

Live storage	0.19 T.M.C.
Dead storage	Nil
Carry-over	,,
Annual reservoir losses	0.04 T.M.C.
Filling period	June to September
Depletion period	July to February
Catchment area	11.1 square miles
Area submerged	353 acres
Full reservoir level	R.L. 1,812
Minimum pond level	R.L. 1,770

5. **Description of the headworks**

Dam: earthen, 3,300 feet long, 62 feet high

Spillway: 381 feet long, capacity, 6,082 cusecs

Outlets: capacity 57 cusecs

6. **Description of the canal**

Sagarnadi Canal (initially contour, then ridge); left bank; 9.7 miles long (branches 13.1 miles); two seasonal; unlined; capacity 57 cusecs

7. **Date of beginning of construction** 1956-57

8. **Date of beginning of operation** 1960-61

9. **Probable date of beginning of full operation** 1964-65

IRRIGATION ASPECTS

10. **Gross commanded area and culturable commanded area, district-wise**

	District Seoni
G. C. A.	6,100 acres
C. C. A.	5,400 ,,

11. Area irrigated annually and intensity of irrigation

	Area irrigated annually	*Intensity of irrigation*
Proposed	4,300 acres	79.6 percent
Actual (1960-61)	200 ,,	3.7 ,,

12. Normal rainfall and river supply diverted

Month	*Rainfall*			*River supply diverted*	*Capacity factor*
	Normal	*Maximum*	*Minimum*	*Proposed*	*Proposed*
1	*2*	*3*	*4*	*5*	*6*
	.....*inches*.....			.....*T. M. C*.....	
June	8.0	20.7	0.7	Nil	—
July	17.4	29.3	4.9	0.03	0.20
August	13.6	24.8	6.8	0.03	0.20
September	7.5	16.0	1.8	0.08	0.54
October	2.7	10.1	Nil	0.10	0.65
November	0.8	9.9	,,	0.01	0.07
December	0.3	1.6	,,	0.01	0.07
January	0.9	4.4	,,	0.01	0.07
February	0.9	4.4	,,	0.01	0.07
March	0.9	2.7	,,	Nil	—
April	0.7	3.9	,,	,,	—
May	1.0	6.6	,,	,,	—
Total	**54.7**			**0.28**	

Note :—Tank started irrigation in 1960-61, when only 0.1 T.M.C. was diverted, further particulars not available

13. Not available

14. (a) Characteristics of soils in the commanded area

Black cotton soil and sandy soil

(b) Has any study been made of the likely effect of the introduction of irrigation on soil characteristics ?

No

15. Pattern of cultivation in the area commanded before the scheme came into operation

Perennial		*Kharif*		*Rabi*		
Percentage of principal crops	*Total area (T. acres)*	*Percentage of principal crops*	*Total area (T. acres)*	*Precentage of principal crops*	*Total area (T. acres)*	*Total cropped area (T. acres)*
Sugarcane		*Paddy*		*Wheat*		
11.1	0.3	55.6	1.5	33.3	0.9	2.7

16. (a) Proposed pattern of irrigated cultivation

Kharif		*Rabi*		
Percentage of principal crops	*Total area (T. acres)*	*Percentage of principal crops*	*Total area (T. acres)*	*Grand Total (T. acres)*
Paddy		*Wheat*		
90.7	3.9	9.3	0.4	4.3

(b) Are there any rules for regulating crop pattern ? No

17. Actual crop pattern obtained after the introduction of irrigation

The tank started irrigation in 1960-61

Rabi	
Percentage of principal crops	*Total area (T. acres)*
Others	
100.0	0.2

18. Duty and Delta at canal head

Kharif : 15th July to 14th November (122 days)

Rabi : 15th November to 15th February (93 days)

As anticipated				
Duty (acres per mean cusec)		*Delta (feet)*		
Kharif	*Rabi*	*Kharif*	*Rabi*	*Overall*
136	207	1.8	0.9	1.5

19. (a) Number of tanks in operation in the irrigated area and the area irrigated therefrom

Nil

(b) Number of wells in operation in the irrigated area and the area irrigated therefrom

Nil

20. Quantum of river supplies available in relation to withdrawals

River supply data not available

21. to 24. Not applicable

GENERAL

25. Aspects other than irrigation and power; water supply (month-wise), if any, required for these aspects; financial returns

Nil

26. Total cost of the scheme	Rs 23 lakhs
27. Cost per acre irrigated	Rs. 581
28. Not applicable	
29. Financial return of the scheme (as anticipated)	1.92 percent

30. Main features and purpose of the scheme

Conversion of rain-fed cultivation to irrigated agriculture, thereby improving crop quality and yield; some new areas will be developed; total 4,000 acres.

ARI TANK 5B-G.9-Ma.2

1. Name of State Madhya Pradesh

2. Scope of the scheme or system

Tank irrigation scheme; C.C.A., 21,932 acres

3. Source of supply

Hirri Nadi near Ari/Wainganga/**Godavari**

Utilisation upstream:

existing: nil

proposed: nil

4. Description of the reservoir or tank

Live storage	0.46 T.M.C.
Dead storage	0.09 ,,
Carry-over	Nil
Annual reservoir losses	0.06 T.M.C.
Filling period	June to September
Depletion period	July to February
Catchment area	26 square miles
Area submerged	887 acres
Full reservoir level	R. L. 436 } arbitary datum
Minimum pond level	R. L. 415 } arbitary datum

5. Description of the headworks

Dam : earthen, 5,200 feet long, 64 feet high

Spillway : clear overfall weir, 354 feet long, capacity 8,487 cusecs

Outlets : capacity 158 cusecs

6. Description of the canal

Ari Canal (contour and ridge); left bank; 17.9 miles long (branches 32.9 miles); two seasonal; unlined; capacity **158 cusecs**

7. Date of beginning of construction 1947

8. Date of beginning of operation 1952-53

9. Probable date of beginning of full operation 1955-56

IRRIGATION ASPECTS

10. Gross commanded area and culturable commanded area, district-wise

District Seoni

G.C.A.	27,200 acres
C.C.A.	21,900 ,,

11. Area irrigated annually and intensity of irrrigation

	Area irrigated annually	*Intensity of irrigation*
Proposed	11,000 acres	50.2 percent
Actual maximum during 8 years	10,200 „	46.6 „

12. Normal rainfall and river supply diverted **13.**

Month	*Rainfall*			*River supply diverted*		*Capacity factor*	
	Normal	*Maximum*	*Minimum*	*Actual maximum*	*Proposed*	*Actual maximum*	*Proposed*
1	2	3	4	5	6	7	8
	.....inches.....			*.....T.M.C.....*			
June	8.4	30.9	0.2	Nil	Nil	—	—
July	17.3	30.6	7.6	0.16	0.09	0.38	0.21
August	15.0	24.0	6.4	0.23	0.11	0.54	0.26
September	8.4	19.3	0.5	0.37	0.24	0.90	0.59
October	1.9	11.4	Nil	0.32	0.30	0.76	0.71
November	0.5	4.3	„	Nil	0.05	—	0.12
December	0.1	2.7	„	„	0.01	—	0.02
January	0.8	5.6	„	0.12	0.01	0.28	0.02
February	0.8	3.7	„	0.01	0.01	0.03	0.03
March	0.9	5.5	„	Nil	Nil	—	—
April	0.6	3.3	„	„	„	—	—
May	0.9	5.0	„	„	„	—	—
Total	**55.6**			**1.21**	**0.82**		

13. Not available

14. (a) Characteristics of soils in the commanded area

Kanhar (deep black soil) and *Bardi* (red soil with low percentage of clay), effective depth about 5 feet

(b) Has any study been made of the likely effect of the introduction of irrigation on soil characteristics ?

No

15. Pattern of cultivation in the area commanded before the scheme came into operation

Predominantly paddy

16. (a) Proposed pattern of irrigated cultivation

Kharif		*Rabi*		*Grand Total (T. acres)*
Percentage of principal crops	*Total area (T. acres)*	*Percentage of principal crops*	*Total area (T. acres)*	
Paddy		*Wheat*		
90.9	10.0	9.1	1.0	11.0

(b) Are there any rules for regulating crop pattern ? No

17. Actual crop pattern obtained after the introduction of irrigation

Not available—mostly *Kharif*

18. Duty and Delta at canal head

Kharif : 16th July to 14th November (122 days)

Rabi : 15th November to 15th February (93 days)

As anticipated					*As obtained*
Duty (acres per mean cusec)		*Delta (feet)*			*Delta (feet)*
Kharif	*Rabi*	*Kharif*	*Rabi*	*Overall*	*Overall*
136	207	1.8	0.9	1.7	2.7

19. (a) Number of tanks in operation in the irrigated area and the area irrigated therefrom

22 tanks irrigating 1,792 acres, included in the C.C.A.

(b) Number of wells in operation in the irrigated area and the area irrigated therefrom

Nil

20. Quantum of river supplies available in relation to withdrawals

River supply data not available

21. to 24. Not applicable

GENERAL

25. Aspects other than irrigation and power; water supply (month-wise), if any, required for these aspects; financial returns

Nil

26. Total cost of the scheme Rs. 27.8 lakhs

27. Cost per acre irrigated Rs. 253

28. Not applicable

29. Financial return of the scheme

(i)	**as anticipated**	1.48 percent
(ii)	**as obtained**	0.33 ,,

30. Main features and purpose of the scheme

Conversion of rain-fed cultivation to irrigated agriculture

GANGULPARA TANK

6B-G.9-Ma.3

1. **Name of State** — Madhya Pradesh

2. **Scope of the scheme or system**
   Tank irrigation scheme; C.C.A. 10,115 acres

3. **Source of supply**
   Ghisri Nalla near Pipartola/Wainganga/Godavari
   Utilisation upstream :
   existing: nil
   proposed: nil

4. **Description of the reservoir or tank**

Live storage	0.39 T.MC.
Dead storage	0.02 ,,
Carry-over	Not available
Annual reservoir losses	0.06 T.M.C.
Filling period	June to September
Depletion period	July to November
Catchment area	12.5 square miles
Area submerged	444 acres
Full reservoir level	R.L. 1.068
Minimum pond level	R.L. 1.034

5. **Description of the headworks**

Dam:	earthen, 9,870 feet long, 64 feet high
Spillway:	266 feet long, capacity 6,770 cusecs
Outlet:	4 feet x 4 feet, capacity 112 cusecs

6. **Description of the canal**
   Gangulpara Canal (initially contour, then ridge); right bank. ; 12.3 miles long (branches 14.4 miles); one seasonal; unlined; authorised capacity **112 cusecs**

7. **Date of beginning of construction** — 1954-55

8. **Date of beginning of operation** — 1957-58

9. **Probable date of beginning of full operation** — 1962-63

IRRIGATION ASPECTS

10. **Gross commanded area and culturable commanded area, district-wise**

District Balaghat	
G.C.A.	11,300 acres
C.C.A.	10,100 ,,

11. Area irrigated annually and intensity of irrigation

	Area irrigated annually	*Intensity of irrigation*
Proposed	8,500 acres	84.2 percent
Actual maximum	3,000 ,,	29.7 ,,

12. Normal rainfall and river supply diverted

Month	*Rainfall*			*River supply diverted.*		*Capacity factor*	
	Normal	*Maximum*	*Minimum*	*Actual maximum*	*Proposed*	*Actual maximum*	*Proposed*
1	2	3	4	5	6	7	8
	.....*inches*.....			.....*T.M.C*.....			
June	7.5	30.1	0.1	Nil	Nil	—	—
July	22.5	37.8	8.7	0.10	0.07	0.33	0.23
August	17.7	35.0	7.5	0.01	0.09	0.03	0.30
September	9.5	19.6	0.9	0.12	0.20	0.41	0.69
October	2.5	10.5	Nil	0.07	0.26	0.24	0.87
November	3.3	4.9	,,	Nil	0.04	—	0.14
December		2.5	,,	,,	Nil	—	—
January		6.0	,,	,,	,,	—	—
February		4.6	,,	,,	,,	—	—
March		5.4	,,	,,	,,	—	—
April		5.3	,,	,,	,,	—	—
May		3.7	,,	,,	,,	—	—
Total	**63.0**			**0.30**	**0.66**		

13. Not available

14. (a) Characteristics of soils in the commanded area

Kanhar (deep black soil), *Morand* (red soil with low percentage of clay) and *Sikar* (mixture of red and yellow soil); effective depth about 5 feet.

(b) Has any study been made of the likely effect of the introduction of irrigation on soil characteristics ?

No

15. Pattern of cultivation in the area commanded before the scheme came into operation

Perennial		*Kharif*			*Rabi*			*Total cropped area (T. acres)*
Percentage of principal crops	*Total area (T. acres)*	*Percentage of principal crops*		*Total area (T. acres)*	*Percentage of principal crops*		*Total area (T. acres)*	
Others		*Paddy*	*Others*		*Wheat*	*Others*		
1.1	0.1	90.2	2.2	8.5	2.4	4.1	0.6	9.2

16. (a) Proposed pattern of irrigated cultivation

Kharif	
Percentage of principal crops	*Total area (T. acres)*
Paddy	
100	8.5

(b) Are there any rules for regulating crop pattern ? No

17. Actual crop pattern obtained after the introduction of irrigation

Kharif		*Rabi*		*Grand Total (T. acres)*
Percentage of principal crops	*Total area (T. acres)*	*Percentage of principal crops*	*Total area (T. acres)*	
Paddy		*Wheat*		
96.7	2.9	3.3	0.1	3.0

18. Duty and Delta at canal head

As anticipated		*As obtained*
Duty (acres per mean cusec)	*Delta (feet)*	*Overall Delta (feet)*
Kharif	*Kharif*	
136	1.8	2.3

19. (a) Number of tanks in operation in the irrigated area and the area irrigated therefrom

Nil

(b) Number of wells in operation in the irrigated area and the area irrigated therefrom

Nil

20. Quantum of river supplies available in relation to withdrawals

River supply data not available

21. to 24. Not applicable

GENERAL

25. Aspects other than irrigation and power; water supply (month-wise), if any, required for these aspects; financial returns

Nil

26. Total cost of the scheme Rs. 50 lakhs

27. Cost per acre irrigated Rs. 584

28. Not applicable

29. Financial return of the scheme

(i) as anticipated 1.19 percent

(ii) as obtained 0.22 ,,

30. Main features and purpose of the scheme

Conversion of rain-fed cultivation to irrigated agriculture, thereby improving crop quality and yield over an area of 8,000 acres

GANGAPUR PROJECT 7B-G.1-M.1

1. **Name of State** Maharashtra (formerly in Bombay)

2. **Scope of the scheme or system**
Irrigation scheme; flow-cum-storage; C.C.A. 67,260 acres

3. **Source of supply**
(i) **Godavari** at Gangapur; (ii) Alandi Nalla/**Godavari** and (iii) Nasarda Nalla/**Godavari**
Utilisation upstream : nil

4. **Description of the reservoir or tank at Gangapur**

Live storage	7.20 T.M.C.
Dead storage	0.40 ,,
Carry-over	1.00 ,,
Annual reservoir losses	0.60 ,,
Filling period	15th June to end of September
Depletion period	1st October to 14th June
Catchment area	138 square miles
Area submerged	6,208 acres
Full reservoir level	R. L. 2,009
Minimum pond level	R. L. 1,942

5. **Description of the head works**

Dam:	earthen, 12,500 feet long, 123 feet high
Spillway:	334 feet long, capacity 81,000 cusecs
Head regulators:	one vent, 6 feet 6 inches × 6 feet 6 inches and 2 vents, 8 feet × 8 feet 6 inches each

6. **Description of the canals**
Nasik Right Bank Canal (contour for first 8 miles and then ridge); 18 miles long; two seasonal; unlined; authorised capacity **130 cusecs**
Nasik Left Bank Canal (contour); 29 miles long; perennial; unlined; authorised capacity **315 cusecs**
During monsoon, the waters of the Alandi Nalla will feed the Nasik Left Bank Canal and the waters of the Nasarda Nalla will feed the Nasik Right Bank Canal to the extent of 2.5 T.M.C.
Godavari Canals **16A-G. 1-M.1** also get part supplies (1.2 T.M.C.) from Gangapur storage

7. **Date of beginning of construction** 1948-49

8. **Date of beginning of operation**
Portion of Nasik Left Bank Canal opened in October 1957. Part storage is, however, being used on Godavari Canals ex-Nandur-Madhmeshwar weir since 1955

9. **Probable date of beginning of full operation** October 1962

IRRIGATION ASPECTS

10. Gross commanded area and culturable commanded area, district-wise

District Nasik

	Nasik Right Bank Canal	*Nasik Left Bank Canal*	*Total*
	.....thousand acres.....		
G. C. A.	18.0	66.6	84.6
C. C. A.	14.0	53.3	67.3

11. Area irrigated annually and intensity of irrigation

	Area irrigated annually		*Intensity of irrigation*	
	Nasik Right Bank Canal	*Nasik Left Bank Canal*	*Nasik Right Bank Canal*	*Nasik Left Bank Canal*
	.....thousand acres.....		*.....percentage.....*	
(1) Proposed	11.0	33.0	78.5	61.9
(2) Actual maximum	0.6	4.6	4.1	8.6

12. Normal rainfall and river supply diverted

Month	*Rainfall*			Nasik Left Bank Canal				Nasik Right Bank Canal			
				River supplies diverted		*Capacity factor*		*River supply diverted*		*Capacity factor*	
	Normal	*Maximum*	*Minimum*	*Actual maximum*	*Proposed*	*Actual maximum*	*Proposed*	*Actual maximum*	*Proposed*	*Actual maximum*	*Proposed*
1	2	3	4	5	6	7	8	9	10	11	12
	.....inches.....			*...T. M. C.....*				*...T. M. C.....*			
June	4.8	20.7	Nil	Nil	15th June	—	15th June	0.12	15th June	0.36	15th June
July	8.0	17.7	1.0	0.08	to	0.09	to	Nil	to	—	to
August	8.0	16.2	0.4	Nil	14th Oct.	—	14th Oct.	,,	14th Oct.	—	14th Oct.
September	6.3	16.3	0.1	0.20	2.00	0.25	0.60	0.01	0.45	0.03	0.33
October	2.8	13.7	Nil	0.05	15th Oct.	0.06	15th Oct.	0.03	15th Oct.	0.09	15th Oct.
					to		to		to		to
November	0.8	12.2	,,	0.13	14th Feb.	0.17	14th Feb.	0.01	14th Feb.	0.03	14th Feb.
December	0.2	3.0	,,	0.14	2.00	0.18	0 60	0.02	0.70	0.06	0.51
January	0.1	2.8	,,	0.11		0.13		0.01		0.03	
February	0.1	0.9	,,	0.09	15th Feb.	0.12	15th Feb.	Nil	15th Feb.	—	
					to		to		to		
March	0.1	2.0	,,	0.11	14th June	0.13	14th June	,,	14th June	—	—
April	0.2	2.1	,,	0.11	2.20	0 13	0.67	,,	Nil	—	
May	0.9	5.7	,,	0.13		0.15		,,		—	
Total	**32.3**			**1.15**	**6.20**			**0.20**	**1.15**		

13. Not available

14. (a) **Characteristics of soils in the commanded area**

Sandy to sandy loam 25 percent, silty loam to clayey loam 50 percent and clayey loam to clay 25 percent

A soil depth of more than 18 inches is available in 70 percent of the commanded area and between 9 inches and 18 inches in the remaining 30 percent.

(b) **Has any study been made of the likely effect of the introduction of irrigation on soil characteristics ?**

No

15. Pattern of cultivation in the area commanded before the scheme came into operation (both canals)

Kharif					*Rabi*				
Percentage of principal crops				*Total area (T. acres)*	*Percentage of principal crops*			*Total area (T. acres)*	*Total cropped area (T. acres)*
Paddy	*Bajri*	*Millet*	*Others*		*Wheat*	*Jowar*	*Others*		
17.9	14.0	14.4	26.7	48.6	15.7	2.3	9.0	18.0	66.6

16. (a) **Proposed pattern of irrigated cultivation**

Perennial			*Two seasonal*			*Kharif*			*Continued below*
Percentage of principal crops		*Total area (T. acres)*	*Percentage of principal crops*		*Total area (T. acres)*	*Percentage of principal crops*			
Sugarcane	*Others*		*Vegetables Fodder*	*Fruit & Others*		*Paddy*	*Bajri*	*Others*	
Nasik Right Bank Canal									
—	—	—	19.0	8.2	3.0	18.0	18.4	—	
Nasik Left Bank Canal									
8.0	10.2	6.0	—— 16.0——		5.3	———27.0———			

Continued from above	*Rabi*				*Hot weather*		*Grand Total (T. acres)*
	Total area (T. acres)	*Percentage of principal crops*		*Total area (T. acres)*	*Percentage of principal crops*	*Total area (T. acres)*	
		Wheat	*Others*		*Others*		
Nasik Right Bank Canal							
	4.0	29.0	7.4	4.0	—	—	11.0
Nasik Left Bank Canal							
	8.9	15.9	15.0	10.2	7.9	2.6	33.0

(b) Are there any rules for regulating crop pattern ?

No, but crop pattern will be regulated by contract provisions

17. Actual crop pattern obtained after the introduction of irrigation (both canals)

Perennial			*Rabi*				
Percentage of principal crops		*Total area (T. acres)*	*Percentage of principal crops*			*Total area (T. acres)*	*Grand Total (T. acres)*
Sugarcane	*Others*		*Jowar*	*Wheat*	*Others*		
0.2	4.4	0.2	0.4	62.1	32.9	4.2	4.4

During 1957-58, year of maximum river supply diverted

18. Duty and Delta at canal head

As anticipated										*Continued below*
Duty (acres per mean cusec)								*Delta (feet)*		
Sugarcane		*Two seasonal*		*Kharif*	*Rabi*	*Hot weather*		*Sugarcane*		
Kharif	*Rabi*	*Kharif*	*Rabi*	*Others*	*Others*	*Sugarcane*	*Others*	*Kharif*	*Rabi*	
Nasik Right Bank Canal										
...	...	100	108	150	162	...	...	...	...	
Nasik Left Bank Cannal										
50	54	100	108	150	162	36	72	4.0	4.4	

Continued from above	*Delta (feet)*							*As obtained Delta (feet)*	
	Two seasonal		*Kharif*	*Rabi*	*Hot weather*		*Overall*	*Overall*	
	Kharif	*Rabi*	*Others*	*Others*	*Sugarcane*	*Others*			
Nasik Right Bank Canal									
	1.9	1.7	1.2	1.1	...	...	2.4		
Nasik Left Bank Canal									7.1
	2.0	1.7	1.3	1.3	7.0	2.0	4.3		

19. (a) Number of tanks in operation in the irrigated area and the area irrigated therefrom

Nil

(b) Number of wells in operation in the irrigated area and the area irrrigated therefrom

980 wells, irrigating about 2 to 3 acres of seasonal crops each, included in the C.C.A.

20. Quantum of river supplies available in relation to withdrawals

Available river supplies may be just sufficient to meet irrigation requirements

21. to 24. Not applicable

GENERAL

25. Aspects other than irrigation and power; water supply (monthwise), if any, required for these aspects; financial returns

Water supply to Nasik Town 0.6 T.M.C.

26. Total cost of the scheme Rs. 4,91 lakh

27. Cost per acre irrigated Rs. 770

28. Not applicable

29. Financial return of the scheme

(i) as anticipated 3.7 percent

(ii) as obtained Not available

30. Main features and purpose of the scheme

Irrigation of about 44,000 acres

BENDSURA PROJECT 8B-G.1-M.2

1. **Name of State** Maharashtra (formerly in Hyderabad)

2. **Scope of the scheme or system**
   Irrigation scheme; flow-cum-storage; C.C.A., 9,300 acres

3. **Source of supply**
   Bendsura at Pali/Sindphana/**Godavari**
   Utilisation upstream: nil

4. **Description of the reservoir or tank**

Live storage	0.39 T.M.C.
Dead storage	0.12 „
Carry-over	Nil
Annual reservoir losses	0.11 T.M.C.
Filling period	15th June to 30th September
Depletion period	15th June to 14th February
Catchment area	73 square miles
Area submerged	960 acres
Full reservoir level	R. L. 1,857
Minimum pond level	R. L. 1,830

5. **Description of the head-works**

Dam :	earthen, 66 feet high
Spillway :	350 feet long, capacity 18,200 cusecs
Head regulator :	left bank, two vents, 2 feet × 2.5 feet

6. **Description of the canal**
   Bendsura Canal (contour); left bank; 22 miles long; two seasonal; unlined; authorised capacity **40 cusecs**

7. **Date of beginning of construction** April 1948

8. **Date of beginning of operation**
   Part length of canal first operated in April, 1956

9. **Probable date of beginning of full operation** October 1962

IRRIGATION ASPECTS

10. **Gross commanded area and culturable commanded area, district-wise**

District Bhir	
G.C.A.	11,500 acres
C.C.A.	9,300 „

11. Area irrigated annually and intensity of irrigation

	Area irrigated annually	*Intensity of irrigation*
	.....thousand acres.....	*.....percentage.....*
(1) Proposed	7.5	80.6
(2) Actual maximum in 6 years	6.1	65.6

12. Normal rainfall and river supply diverted

Month	*Rainfall*			*River supply diverted*		*Capacity factor*
	Normal	*Maximum*	*Minimum*	*Actual maximum*	*Proposed*	*Proposed*
1	*2*	*3*	*4*	*5*	*6*	*7*
	.....inches.....			*.....T.M.C.....*		
June	4.4	12.2	0.9	Not	15th June	
July	5.4	9.8	0.2	available	to	
August	4.4	13.6	0.4		14th Oct.	
September	8.2	16.0	Nil		0.23	0.55
October	2.1	10.8	,,		15th Oct.	
November	1.0	1.9	,,		to	
December	0.4	Nil	,,		14th Feb.	
January	0.2	,,	,,		0.26	0.61
February	0.2	,,	,,		15th Feb.	
March	0.2	,,	,,		to	
April	0.3	,,	,,		14th June	
May	0.5	,,	,,		Nil	—
Total	**27.3**			**0.49** assumed	**0.49**	

13. Not available

14. (a) Characteristics of soils in the commanded area

Sandy to sandy loam 10 percent, silty loam to clay loam 30 percent and clay loam to clay 60 percent

A soil depth of more than 18 inches is available in the entire commanded area

(b) Has any study been made of the likely effect of the introduction of irrigation on soil characteristics ?

15. Pattern of cultivation in the area commanded before the scheme came into operation

Perennial				Two seasonal				Continued below
Percentage of principal crops			Total area (T. area)	Percentage of principal crops			Total area (T. acres)	
Sugarcane	Others	Miscellaneous		Cotton	Chillis	Vegetable		
0.4	1.0	7.2	0.8	4.2	1.0	0.2	0.5	

Continued from above	Kharif						Rabi				Total cropped (T. acres)
	Percentage of principal crops					Total area (T. acres)	Percentage of principal crops			Total area (T. acres)	
	Paddy	Jowar	Bajri	Ground-nut	Others		Wheat	Jowar	Others		
	1.0	6.0	17.5	8.4	14.4	4.4	3.0	27.8	7.9	3.6	9,3

16. (a) Proposed pattern of irrigated cultivation

Two seasonal		Kharif			Rabi		Grand Total (T. acres)
Percentage of principal crops	Total area (T. acres)	Percentage of principal crops		Total area (T. acres)	Percentage of principal crops	Total area (T. acres)	
Others		Paddy	Others		Jowar		
13.3	1.0	6.7	40.0	3.5	40.0	3.0	7.5

(b) Are there any rules for regulating crop pattern ? No

17. Actual crop pattern obtained after the introduction of irrigation

Perennial			Kharif		Rabi		Grand Total (T. acres)
Percentage of principal crops		Total area (T. acres)	Percentage of principal crops	Total area (T. acres)	Percentage of principal crops	Total area (T. acres)	
Sugarcane	Others		Others		Jowar and wheat		
0.4	1.6	0.1	30.3	1.9	67.7	4.1	6,1

18. Duty and Delta at canal head

As anticipated

Duty (acres per mean cusec)					*Delta (feet)*					
Two seasonal		*Paddy long term*	*Kharif*	*Rabi*	*Two seasonal*		*Paddy long term*	*Kharif*	*Rabi*	*Overall*
Kharif	*Rabi*				*Kharif*	*Rabi*				
160	140	80	400	200	1.7	1.9	3.3	0.8	1.5	1.5

19. (a) Number of tanks in operation in the irrigated area and the area irrigated therefrom

Nil

(b) Number of wells in operation in the irrigated area and the area irrigated therefrom

81 wells, irrigating 2 to 3 acres per well, included in the C. C. A.

20. Quantum of river supplies available in relation to withdrawals

River supply data not available

21. to 24. Not applicable

GENERAL

25. Aspects other than irrigation and power; water supply (month-wise), if any, required for these aspects; financial returns

Water supply to Bhir Town.....0.04 T.M.C.

26. Total cost of the scheme Rs. 59 lakhs

27. Cost per acre irrigated Rs. 810

28. Not applicable

29. Financial return of the scheme

(i) as anticipated 0.63 percent

(ii) as obtained Not available

30. Main features and purpose of the scheme

Conversion of un-irrigated cultivation to irrigated agriculture-7500 acres

Table I

Abstract of Major and Medium Schemes

Index number	*Name of Scheme or Project*	*Power installed*	*C.C.A. or Ayacut*	*Annual irrigation*		*Annual diversion*	
				Maximum to-date	*Ultimate*	*Maximum to-date*	*Ultimate*
1.	2.	3.	4.	5.	6.	7.	8.
		...kW....		*.....acres.....*		*....T.M.C.....*	
	ANDHRA PRADESH		*Ayacut*				
1B-G.4-A.1	Nizamsagar Hydro-electric Scheme	15,000	—	—	—	*	*
2B-G.5-A.2	Kadam Project	...	65,000	(5,000)	85,000	(1.0)	16.2
3B-G.12-A.3/O.1	Machkund Hydro-electric Scheme (jointly with Orissa)	(114,750)	...	...	...	*33.3*	*44.2*
	Total	**129,750**	**65,000**	**5,000**	**85,000**	1.0	16.2
						33.3	*44.2*
	MADHYA PRADESH		*C.C.A.*				
4B-G.9-Ma.1	Sagarnadi Tank	...	5,400	200	4,300	—	0.3
5B-G.9-Ma.2	Ari Tank	...	21,900	10,200	11,000	1.2	0.8
6B-G.9-Ma.3	Gangulpara Tank	...	10,100	3,000	8,500	0.3	0.7
	Total	...	**37,400**	**13,400**	**23,800**	**1.5**	**1.8**
	MAHARASHTRA						
7B-G.1-M.1	Gangapur Project	...	67,300	5,200	44,000	1.4	7.4
8B-G.1-M.2	Bendsura Project	...	9,300	6,100	7,500	(0.4)	0.5
	Total	...	**76,600**	**11,300**	**51,500**	**1.8**	**7.9**
	MYSORE	Nil					
	ORISSA		*Ayacut*				
3B-G.12-A.3/O.1	Machkund Hydro-electric Scheme (jointly with Andhra Pradesh)			See **2B-G.12-A.30.1**			
	Grand Total	**129,750**	**179,000**	**29,700**	**160,300**	4.3	25.9
						33.3	*44.2*

* *Same as in Nizamsagar Project (5A-G. 4-A. 5). Irrigation releases are used for Power generation.*

Note: Figures in italics represent diversion for power generation only.

Table II

Particulars of minor schemes

Serial number	*Name of Scheme or Project*	*Name of sub-basin*	*Capacity tanks* (*M. Cft.*)	*Capacity Diversion Schemes* (*Cusecs*)	*C. C. A. or Ayacut* (*acres*)	*Area irrigated during 1959-60 or 1960-61* (*acres*)
1	2	3	4	5	6	7
	ANDHRA PRADESH				*Ayacut*	
	Karimnagar district					
1.	Bandalvagu Project	G. 5 Middle Godavari	143	...	1,170	460
2.	Rollavagu Project	,,	275	...	1,843	178
	and Buggacheroo		17	...	465	109
3.	Yellamma Cheruvu	G. 6 Manair	160	...	1,500	1,305
	Total				**4,978**	**2,052**
	MADHYA PRADESH				*C.C.A.*	
	Balaghat district					
1.	Chikhla Tank	G. 9 Pranhita	30	...	600	363
2.	Chawarpani Tank	,,	120	...	4,135	2,300
	Total			...	**4,735**	**2,663**
	Bastar district					
1.	Cherpali Tank	G. 11 Indravati	12	...	650	400
2.	Jugani Tank	,,	19	...	600	(400)
3.	Samund Tank	,,	24	...	1,102	350
	Total				**2,352**	**1,150**
	Seoni district					
1.	Badalpar Tank	G. 9 Pranhita	10	...	600	176
2.	Kesla Regulator	,,	...	5	525	18
	Total				**1,125**	**194**
	Total for Madhya Pradesh				**8,212**	**4,007**

Table II *(continued)*
Particulars of minor schemes

Serial number	*Name of Scheme or Project*	*Name of sub-basin*	*Capacity tanks* (*M. Cft*)	*Capacity Diversion Schemes* (*cusecs*)	*C.C.A. or Ayacut* (*acres*)	*Area irrigated during 1959-60 or 1960-61* (*acres*)
1	2	3	4	5	6	7
	MAHARASHTRA				*C.C.A.*	
	Amravati district					
1.	Paknalla anicut	G. 8 Wardha	...	10	635	132
2.	Patnallia anicut	,,	...	7	520	93
	Total				**1,155**	**225**
	Bhandara district					
1.	Salegaon Tank	G. 9 Pranhita	120	...	3,016	125
2.	.Nawatalao	,,	27	...	857	482
3.	Lobi Tank	,,	41	...	780	(Nil)
4.	Rajoli Tank	,,	31	...	500	8
	Total		**219**		**5,153**	**615**
	Nagpur district					
1.	Dohegaon Tank	G. 8 Wardha	25	...	1,450	18
	Total for Maharashtra				**7,758**	**858**
	MYSORE	Nil				
	ORISSA				*Ayacut*	
	Koraput district					
1.	Dudhari diversion weir and channels	N.A.	...	N.A.	626	N.A.
2.	Digapur diversion weir	,,	...	,,	767	,,
3.	Pidia minor irrigation tank	,,	N.A.	...	1,068	,,
4.	Anantapalli minor irrigation tank	,,	,,	...	1,000	,,
5.	Phatakate diversion weir and channel	,,	...	N.A.	800	,,
	Total				**4,261**	
	Grand Total				**25,209**	

Table III

Particulars of small tanks and diversions

Serial number	*Name of district*	*Name of sub-basin*	*Number of tanks and diversions*	*C.C.A. or Ayacut (acres)*	*Area irrigated during 1959-60 or 1960-61 (acres)*
1	2	3	4	5	6
	ANDHRA PRADESH			*Ayacut*	
1.	Adilabad	53% in G. 5 Middle Godavari ; 38% in G. 9 Pranhita and 9% in G. 7 Penganga	168	8,507	N.A.
2.	Karimnagar	57% in G. 6 Maner : 31% in G. 5 Middle Godavari and 12% in G. 10 Lower Godavari	826	39,869	,,
3.	Khammam	G. 10 Lower Godavari	253	14,764	,,
4.	Nizamabad	48% in G. 5 Middle Godavari ; 41% in G. 4 Manjra and 11% in G. 6 Maner	22	2,509	,,
5.	Warangal	64% in G. 10 Lower Godavari and 36% in G. 6 Maner	546	27,972	,,
	Total		**1,815**	**93,621**	,,
	MADHYA PRADESH			*C.C.A.*	
1.	Balaghat	G. 9 Pranhita	11	3,372	2,355
2.	Bastar	72% in G. 11 Indravati ; 16% in G. 12 Sabari and 12% in G. 10 Lower Godavari	15	3,694	2,684
3.	Chhindwara	98% in G. 9 Pranhita ; 2% in G. 8 Wardha	5	1,007	873
4.	Seoni	G. 9 Pranhita	5	1,563	768
	Total		**36**	**9,636**	**6,680**
	MAHARASHTRA				
	Ahmednagar	56% in G. 2 Pravara ; 44% in G. 1 Upper Godavari and less than 1 % in G. 4 Manjra	8	2,300	1,305
2.	Akola	87% in G. 7 Penganga and 13% in G. 8 Wardha	2	230	80

Table III—*(continued)*
Particulars of small tanks and diversions

Serial number	*Name of district*	*Name of sub-basin*	*Number of tanks and diversions*	*A.C.C. or Ayacut (acres)*	*Area irrigated during 1959-60 or 1960-61 (acres)*
1	2	3	4	5	6
3.	Amravati	100% in Wardha; less than 1% in G. 7 Penganga	3	282	68
4.	Bhandhara	G. 9 Pranhita	2	515	292
5.	Buldhana	51% in G. 7 Penganga and 49% in G. 3 Purna	7	600	356
6.	Chanda	57% in G. 9 Pranhita; 25% in G. 11 Indravati; 17% in G. 8 Wardha and 1% in G. 10 Lower Godavari	4	1,200	433
7.	Nagpur	67% in G. 9 Pranhita and 33% in G. 8 Wardha	1	400	233
8.	Nanded	31% in G. 1 Upper Godavari; 30% in G. 7 Penganga; 33% in G. 4 Manjra and 6% in G. 5 Middle Godavari	26	1,199	649
9.	Nasik	97% in G. 1 Upper Godavari and 3% in G. 2 Pravara	44	740	595
10.	Wardha	G. 8 Wardha	6	600	325
11.	Yeotmal	75% in G. 7 Penganga and 25% in G. 8 Wardha	2	400	375
	Total		**105**	**8,466**	**4,711**
	MYSORE		Nil	...	...
	ORISSA				
1.	Koraput	57% in G. 12 Sabari and 43% in G. 11 Indravati	116	13,679	N.A.

Note : The percentages in column 3 denote percentages of that part of the district named in column 2 which lies in the Godavari basin.

Table IV
Abstract of minor schemes and small tanks and diversion

State/District	Minor Schemes			Small tanks and diversion			Total		Duty (acres per M.Cft.	Annual diversion 1959-60 or 1960-61
	Numbers	C.C.A. or Ayacut	Annual irrigation 1959-60 or 1960-61	Numbers	C.C.A. or Ayacut	Annual irrigation 1959-60 or 1960-61	C.C.A. or Ayacut	Annual irrigation 1959-60 or 1960-61		
1	2	3	4	5	6	7	8	9	10	11
		...acres ..... Ayacut			.....acres..... Ayacut					T.M.C.
ANDHRA PRADESH										
Adilabad	...	...	...	168	8,507	2,000	8,507	(2,000)	6	0.33
Karimnagar	3	4,978	2,052	826	39,869	37,948	44,847	(40,000)	6	6.67
Khammam	...	...	...	253	14,764	7,000	14,764	(7,000)	6	1.17
Nizamabad	...	...	.	22	2,509	1,000	2,509	(1,000)	6	0.17
Warangal	...	...	...	546	27,972	20,000	27,972	(20,000)	6	3.33
Total	**3**	**4,978**	**2,052**	**1,815**	**93,621**	**67,948**	**98,599**	**70,000**		**11.67**

(Figures in brackets are assumed figures)

Notes : 1. *The assumed figures in col. 9 are based on the district-wise statistics in table V.*
2. *The duty (acres per M. Cft.) is based on table VI and the assumption that irrigation in Telengana is generally 80% Abi and 20% Tabi.*
3. *The maximum to-date annual irrigation and annual diversion in col. 4 and 6 of the statement at the beginning of this Annexure have been assumed to be the same as the annual irrigation and annual diversion during 1959-60 or 1960-61.*
4. *The ultimate annual irrigation in col. 6 of the statement at the beginning of this Annexure has been assumed on the basis of the Ayacut.*
5. *The ultimate annual diversion in col. 8 of the statement at the beginning of this Annexure is roughly in the same ratio as the maximum to-date annual diversion bears to the maximum to-date annual irrigation.*

* *For minor schemes*
** *For small tanks and diversion.*

MADHYA PRADESH										
		C.C.A.			C.C.A.		C.C.A.			
Balaghat	2	4,735	2,663	11	3,372	2,355	8,107	5,018	10.5* 11**	0.46
Bastar	3	2,352	1,150	15	3,694	2,684	6,046	3,834	10	0.38
Chhindwara	...	...	...	5	1,007	873	1,007	873	10	0.09
Seoni	2	1,125	194	5	1,563	768	2,688	962	10	0.10
Total	**7**	**8,212**	**4,007**	**36**	**9,636**	**6,680**	**17,848**	**10,687**		**1.03**

Notes: * *For minor scheme.* ** *For small tanks and divertion.*

1. *The maximum to-date annual irrigation and annual diversion in col. 4 and col. 6 of the statement at the beginning of the Annexure have been assumed to be the same as the annual irrigation and annual diversion during 1959-60 or 1960-61.*
2. *The ultimate annual irrigation in col. 6 of the statement at the beginning of this Annexure has been assumed on the basis of the C.C.A.*
3. *The ultimate annual diversion in col. 8 of the statement at the beginning of this annexure is roughly in the same ratio as the maximum to-date annual diversion bears to the maximum to-date annual irrigation.*

Table IV *(continued)*

Abstract of minor schemes and small tanks and diversion

State District	Minor schemes			Small tanks and diversions			Total		Duty (acres per M. C.ft.)	Annual irrigation 1959-60 or 1960-61
	Numbers	C.C.A. or Ayacut	Annual irrigation 1950-60 or 1960-61	Numbers	C.C.A. or Ayacut	Annual irrigation 1959-60 or 1960-61	C.C.A. or Ayacut	Annual irrigation 1959-60 or 1960-61		
1	2	3	4	5	6	7	8	9	10	11
		.....acres.....			.....acres.....					T.M.C.
MAHARASHTRA		C.C.A.			C.C.A.		C.C.A.			
Ahmednagar	—	—	—	8	2,300	1,305	2,300	1,305	17.5	0.07
Akola	—	—	—	2	230	80	230	80	15	0.01
Amravati	2	1,155	225	3	282	68	1,437	293	15	0.02
Bhandhara	4	5,153	615	2	515	292	5,668	907	20	0.04
Buldhana	—	—	—	7	600	356	600	356	15	0.02
Chanda	—	—	—	4	1,200	433	1,200	433	15	0.03
Nagpur	1	1,450	18	1	400	233	1,850	251	15	0.02
Nanded	—	—	—	26	1,199	649	1,199	649	25	0.03
Nasik	—	—	—	44	740	595	740	595	17.3	0.03
Wardha	—	—	—	6	600	325	600	325	15	0.02
Yeotmal	—	—	—	2	400	375	400	375	15	0.03
Total	**7**	**7,758**	**858**	**105**	**8,466**	**4,711**	**16,224**	**5,569**		**0.32**

Note: 1. *The maximum to-date annual irrigation and annual diversion in col. 4 and 6 of the statement at the beginning of this Annexure have been assumed to be the same as the annual irrigation and annual diversion during 1959-60 or 1960-61.*

2. *The ultimate annual irrigation in col. 6 of the statement at the beginning of this Annexure has been assumed on the basis of the C.C.A.*

3. *The ultimate annual diversion in col. 8 of the statement at the beginning of this annexure is roughly in the same ratio as the maximum to-date annual diversion bears to the maximum to-date annual irrigation.*

MYSORE										
ORISSA		*Ayacut*			*Ayacut*		*Ayacut*			
Koraput	5	4,261	(4,261)	116	13,679	(13,679)	17,940	(17,940)	12	1.50

(Figures in brackets are assumed figures)

Note 1. *The annual irrigation in 1959-60 or 1960-61 has been assumed to be the same as the ayacut.*

2. *The maximum to-date annual irrigation and annual diversion in cols. 4 and 6 of the statement at the beginning of this Annexure have been assumed to be the same as the annual irrigation and annual diversion during 1959-60 or 1960-61.*

3. *The ultimate annual irrigation in col. 6 of the statement at the beginning of this Annexure has been assumed on the basis of the Ayacut.*

4. *The ultimate annual diversion in col. 8 of the statement at the beginning of this Annexure is roughly in the same ratio as the maximum to-date annual diversion bears to the maximum to-date annual irrigation.*

Grand Total	**22**	**22,209**	**11,178**	**2,872**	**125,402**	**93,018**	**150,611**	**104,196**		**14.52**

TABLE V

Ayacut and area irrigated by minor schemes, small tanks and diversions in Andhra Pradesh

Serial number	District	Ayacut of schemes							Area irrigated		
		in operation as on 31st March 1951			which came into operation after March 1951				Average for 1941-42 to 1950-51	Average for 1951-52 to 1960-61	During 1959-60 or 1960-61
		Minor schemes	Small tanks and diversions	Total	Minor schemes	Small tanks and diversions	Total	Grand total			
1	2	3	4	5	6	7	8	9	10	11	12
		acres									
1.	Adilabad	4,795	37,206	42,001	...	8,507	8,507	50,508	40,538	45,019	52,448
2.	East Godavari	7,089	18,723	25,812	...	...	...	25,812	N. A.	23,968	24,143
3.	Karimnagar	29,666	159,078	188,744	4,978	39,869	44,847	233,591	119,964	174,862	206,341
4.	Khammam	4,764	18,555	23,319	...	14,764	14,764	38,083	9,160	32,450	22,110
	Bhadrachalam and Nugur Tqs.	...	3,262	3,262	...	...	...	3,262	3,262	3,262	3,262
5.	Medak	11,956	158,010	169,966	...	...	...	169,966	91,140	148,700	179,600
6.	Nizamabad	20,139	81,214	101,353	...	2,509	2,509	103,862	155,761	114,724	125,243
7.	Visakhaptnam	...	N.A.	N.A.	...	...	...	N.A.	...	...	...
8.	Warangal	33,237	62,871	96,108	...	27,972	27,972	124,080	35,850	89,000	103,800

Note : 1. Figures in column 10 are averages of 1941-42, 1944-45, 1948-49, 1949-50 and 1950-51.

2. Figures in column 11 are averages of 9 years (1951-52 to 1959-60).

3. Figures in column 12 are for 1959-60.

TABLE VI

Crop pattern and duty, district-wise

Serial number	*State* / *District*	*Average annual rainfall (inches)*	*Crop pattern*	*Duty (acres per M. Cft.)*
1	2	3	4	5
	ANDHRA PRADESH			
1.	Adilabad	39.4	*Abi* and *Tabi*	6.67 for Abi 3.33 for Tabi
2.	Karimnagar	38.4	,,	,,
3.	Khammam	41.3	,,	,,
4.	Nizamabad	39.4	,,	,,
5.	Warangal	41.3	,,	,,
	MADHYA PRADESH			
1.	Balaghat	63.0	91% *Kharif* and 9% *Rabi* for minor schemes	10.5
			100% *Kharif* for small tanks and diversion	11
2.	Bastar	59.1	100% *Kharif*	10
3.	Chhindwara	45.3	,,	10
4.	Seoni	55.1	94.5% *Kharif* and 5.5% *Rabi* for minor schemes	10
			100% Kharif for small Tanks and diversions	10
	MAHARASHTRA			
1.	Ahmednagar	25.6	*Kharif* 50%, *Rabi* 50%	17.5
2.	Akola	33.5	*Kharif* 40%, *Rabi* 40%, Two seasonal 20%	15
3.	Amraoti	35.4	—do—	15
4.	Bhandara	59.1	Mostly Paddy *Kharif*	20
5.	Buldana	33.5	*Kharif* 40%, *Rabi* 40%, Two seasonal 20%	15
6.	Chanda	55.1	*Kharif* 90%, *Rabi* 5%, Others, 5%	15
7.	Nagpur	46.1	*Kharif* 40%, *Rabi* 60%	15
8.	Nanded	39.4	*Kharif* 33 %, *Rabi* 67%,	25
9.	Nasik	39.4	*Rabi* 100%	17.3
10.	Wardha	43.3	*Kharif* 40%, *Rabi* 40%, Two seasonal 20%	15
11.	Yeotmal	39.4	,,	15
	MYSORE	Nil		
	ORISSA			
1.	Koraput	59.1	Paddy	12